



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Office of Prevention, Pesticides
and Toxic Substances

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MEMORANDUM

July 10, 2000

SUBJECT: **3,5-DCA (vinclozolin degradate): Drinking Water EECs from golf course and canola use.**

TO: Deanna Scher, PM Team Reviewer
Susan Lewis, Chief
Special Review and Reregistration Division (RB1)

FROM: Dirk F. Young, Ph.D., Environmental Engineer
Environmental Fate and Effects Division (7507C)

THRU: Mah T. Shamim, Ph.D., Chief
ERB IV/EFED (7507C)

SUMMARY

This memo summarizes the estimated environmental concentrations (EECs) of the vinclozolin degradate, 3,5-dichloroanaline (DCA), which occur due to application of vinclozolin to golf courses and to canola. These EECs were first presented to you in an e-mail on May 17, 2000. The EECs are summarized in Table 1.

Table 1. Summary of DCA Estimated Environmental Concentrations for Surface Waters

Use	Chronic EEC
golf course: tees and greens	0.3 ppb
golf course: tees, greens, and fairways	2.3 ppb
canola	0.3 ppb

METHODS

Vinclozolin degrades by metabolism, photolysis, and hydrolysis, producing DCA and a few other degradation products which ultimately also degrade to DCA. Because of the lack of data on production rates of DCA due to vinclozolin degradation, EFED could not directly model the DCA EECs. For the canola scenario, EFED used PRZM/EXAMS and calculated the DCA pond concentrations as if DCA were applied directly to the crops of interest and then reduced these

concentration by the DCA-equivalent amount of undegraded vinclozolin (as determined from additional model runs). Because of the lack of a PRZM/EXAMS golf-course scenario, EFED used the Tier 1 GENEEC model with further refinements to calculate EECs for golf course vinclozolin use. Details are given below.

Canola Use

For canola, PRZM/EXAMS was used to calculate the EEC in the standard index reservoir pond. Two PRZM/EXAMS runs were made—one for vinclozolin at the maximum labeled rate and one for DCA. These two runs are described below

Vinclozolin

EFED used standard procedures to determine the surface water EECs for vinclozolin. This procedure involved using PRZM/EXAMS to simulate a 36-year period of vinclozolin use at the maximum allowable application rate (0.45 lb/acre, once per season) on a canola field in North Dakota. A summary of the parameters used for the PRZM/EXAMS simulations is given in Attachment 1. All vinclozolin parameters were taken according to standard EFED practice, including the use of the index reservoir and the percent crop area factor. The input file is located in Attachment 2, and the output file is in Attachment 3.

DCA

EFED used PRZM/EXAMS with the input parameters described in Attachment 1 to calculate DCA concentrations. For the initial estimate of DCA concentrations, EFED assumed that all vinclozolin instantaneously and completely degrades to DCA, giving an effective DCA application rate of 0.255 lb/acre. The input file is in Attachment 4, and the resulting output file is in Attachment 5. Because of the initial assumption of instantaneous and complete conversion of vinclozolin to DCA, the DCA concentrations given in Attachment 5 must be reduced by the amount of vinclozolin that did not degrade (as determined above and given in Attachment 3). The appropriate EEC is then determined as follows:

initial DCA estimate = 0.406 ppb (upper 1-in-10 year average; see Attachment 2)

amount of undegraded vinclozolin = 0.017 ppb (see Attachment 4).

EEC for DCA = $0.406 - 0.017 \times (162/286) = 0.379$ ppb

where 162 is the molecular weight of DCA, and 286 is the molecular weight of vinclozolin.

In addition, the DCA value was reduced by the EFED default percent crop area factor of 0.87. Therefore the chronic EEC is 0.33 ppb for canola.

Golf Course Use

Because of difficulties associated with modeling a golf course with PRZM/EXAMS, EFED chose to use a modified Tier 1 assessment for modeling DCA that results from application of vinclozolin. The methods and modifications are described as follows:

1. Using GENEEC, EFED estimated the amount of vinclozolin that degraded. This was performed by assuming that the peak concentration from GENEEC represents the initial concentration of vinclozolin in the pond prior to sediment partitioning and that the 56-day average concentration represents the long-term average water column concentration equilibrated with the sediment. From GENEEC (see Attachment 6), the peak vinclozolin concentration is 64.8 ppb and the 56-day average concentration is 17.5 ppb.
2. In the standard pond, some vinclozolin will have partitioned into the sediment. Therefore the total amount of undegraded vinclozolin will include the amount of vinclozolin in the water column plus the amount in the sediment. For the standard pond, 58 percent of vinclozolin (which has a K_{oc} value of 535 ml/g) will remain in the water column and 42% will partition into the sediment at equilibrium. Therefore, the total equivalent aqueous concentration in the pond is 30.1 ppb (i.e., 17.5 ppb/0.58), and the total amount of vinclozolin that degraded is 34.7 ppb (i.e., 64.8 ppb – 30.1 ppb).
3. EFED assumed that all vinclozolin eventually degrades to DCA. Therefore the amount of DCA that is formed is assumed to equal to the amount of degraded vinclozolin adjusted for molecular weight differences—that is, the total equivalent DCA concentration is $34.7 \text{ ppb} \times (162/286) = 19.6 \text{ ppb}$. The total equivalent concentration in this case represents the concentration of DCA that would result if all DCA (that which would be in the water column plus what would be in the sediment) were dissolved only in the water column.
4. The DCA will also partition to sediment. For the standard pond, 70 percent of DCA (K_{oc} value of 309 ml/g) will remain in the water column, and 30 percent will partition to the sediment. Therefore, the equilibrium concentration of DCA is $19.6 \text{ ppb} \times 0.7 = 13.9 \text{ ppb}$.
5. The DCA concentration is then adjusted by the default percent crop area factor (0.87) and by the fraction of golf-course area where vinclozolin is applied. EFED assumed that a typical golf course covers 180 acres, that tees and greens cover 5 acres, and that tees, greens and fairways cover 35 acres. Therefore, the EECs are

tees and greens: $\text{EEC} = 13.9 \times 0.87 \times (5/180) = 0.3 \text{ ppb}$

tees, greens, and fairways: $\text{EEC} = 13.9 \times 0.87 \times (35/180) = 2.3 \text{ ppb}$

ATTACMENT 1. PRZM/EXAMS INPUT PARAMETERS

chemicals	vinclozolin and DCA
molecular weight	vinclozolin: 286.1 DCA: 162.03
Solubility	vinclozolin: 2.6 mg/L ⁻¹ DCA: 224 mg/L ⁻¹
vapor pressure	vinclozolin: 2.6 x 10 ⁻⁶ torr DCA: 0.0212 torr
pH 7 hydrolysis half life	vinclozolin: 1.3 days DCA: stable
aqueous photolysis half life (near surface)	vinclozolin: 27.6 days DCA: stable
aerobic soil metabolism half life	vinclozolin: 52.9 days (90% C.I. on mean used for PRZM) DCA: stable
aerobic aquatic metabolism half life	vinclozolin: 106 days (2 x 52.9 day soil metabolism) DCA: stable
anaerobic aquatic metabolism half life	vinclozolin: 402 days (3 times value of single study) DCA: stable
soil organic carbon partitioning (Koc)	vinclozolin: 535 ml/g (mean value) DCA: 309 ml/g
crop	canola
application rate	vinclozolin: 0.45 lb a.i. acre ⁻¹ DCA: 0.255 lb a.i. acre ⁻¹ (0.45 lb/acre * MWDC/MWvinclozolin)
number of applications	1
application method	aerial spray
spray drift	0.16 (standard for index reservoir)
spray efficiency	95% (standard for index reservoir)
Percent Crop Area	0.87 (default)

ATTACHMENT 2. VINCLOZOLIN PRZM INPUT FILE

```
*** PRZM3.12 Input Data File converted from PRZM2.3 ***
*** NDCAN.INP 1/6/00 ***
*** Assume continuous CANOLA, planted on predominant soil in county with ***
*** largest canola acreage in usa; Soil = hamerly loam; ***
*** Manning's N value for small grains, moderate stand, across slope 6% ***
VINCLOZOLIN
Hamerly loam; MLRA 55a, Cavalier County, North Dakota
 0.760    0.500      0   12.00      1      1
```

0.28	0.35	1.00	172.8	5.40	3	3.00	600.0
1							
1	0.10	22.00	80.00		3 91 86 89	0.00	100.0
1	3						
0101 1505 0109							
0.38 0.10 0.07							
.023 .023 .023							
36							
150548	150848	250848	1				
150549	150849	250849	1				
150550	150850	250850	1				
150551	150851	250851	1				
150552	150852	250852	1				
150553	150853	250853	1				
150554	150854	250854	1				
150555	150855	250855	1				
150556	150856	250856	1				
150557	150857	250857	1				
150558	150858	250858	1				
150559	150859	250859	1				
150560	150860	250860	1				
150561	150861	250861	1				
150562	150862	250862	1				
150563	150863	250863	1				
150564	150864	250864	1				
150565	150865	250865	1				
150566	150866	250866	1				
150567	150867	250867	1				
150568	150868	250868	1				
150569	150869	250869	1				
150570	150870	250870	1				
150571	150871	250871	1				
150572	150872	250872	1				
150573	150873	250873	1				
150574	150874	250874	1				
150575	150875	250875	1				
150576	150876	250876	1				
150577	150877	250877	1				
150578	150878	250878	1				
150579	150879	250879	1				
150580	150880	250880	1				
150581	150881	250881	1				
150582	150882	250882	1				
150583	150883	250883	1				
Application Schedule:							
36	1	0	0				
VINCLOZOLIN							
140648	0 2 0.00	0.50 0.95	0.16				
140649	0 2 0.00	0.50 0.95	0.16				
140650	0 2 0.00	0.50 0.95	0.16				
140651	0 2 0.00	0.50 0.95	0.16				
140652	0 2 0.00	0.50 0.95	0.16				
140653	0 2 0.00	0.50 0.95	0.16				
140654	0 2 0.00	0.50 0.95	0.16				
140655	0 2 0.00	0.50 0.95	0.16				
140656	0 2 0.00	0.50 0.95	0.16				
140657	0 2 0.00	0.50 0.95	0.16				
140658	0 2 0.00	0.50 0.95	0.16				
140659	0 2 0.00	0.50 0.95	0.16				
140660	0 2 0.00	0.50 0.95	0.16				
140661	0 2 0.00	0.50 0.95	0.16				
140662	0 2 0.00	0.50 0.95	0.16				
140663	0 2 0.00	0.50 0.95	0.16				
140664	0 2 0.00	0.50 0.95	0.16				
140665	0 2 0.00	0.50 0.95	0.16				

140666 0 2 0.00 0.50 0.95 0.16
 140667 0 2 0.00 0.50 0.95 0.16
 140668 0 2 0.00 0.50 0.95 0.16
 140669 0 2 0.00 0.50 0.95 0.16
 140670 0 2 0.00 0.50 0.95 0.16
 140671 0 2 0.00 0.50 0.95 0.16
 140672 0 2 0.00 0.50 0.95 0.16
 140673 0 2 0.00 0.50 0.95 0.16
 140674 0 2 0.00 0.50 0.95 0.16
 140675 0 2 0.00 0.50 0.95 0.16
 140676 0 2 0.00 0.50 0.95 0.16
 140677 0 2 0.00 0.50 0.95 0.16
 140678 0 2 0.00 0.50 0.95 0.16
 140679 0 2 0.00 0.50 0.95 0.16
 140680 0 2 0.00 0.50 0.95 0.16
 140681 0 2 0.00 0.50 0.95 0.16
 140682 0 2 0.00 0.50 0.95 0.16
 140683 0 2 0.00 0.50 0.95 0.16
 0.0 1 0.0
 0.0 0.0 0.5
 Hamerly loam; Hydrologic Group C;
 100.00 0 0 1 0 0 0 0 0
 0.00 0.00 0.00
 4 535
 3
 1 15.00 1.400 0.224 0.000 0.000
 0.013 0.013 0.000
 0.10 0.224 0.108 2.320 0.00
 2 80.00 1.500 0.224 0.000 0.000
 0.013 0.013 0.000
 2.00 0.224 0.108 0.174 0.00
 3 5.00 1.500 0.228 0.000 0.000
 0.013 0.013 0.000
 5.00 0.228 0.110 0.116 0.00
 0
 YEAR 10 YEAR 10 YEAR 10 1
 1
 1 -----
 7 YEAR
 PRCP TCUM 0 0
 RUNF TCUM 0 0
 INFL TCUM 1 1
 ESLS TCUM 0 0 1.0E3
 RFLX TCUM 0 0 1.0E5
 EFLX TCUM 0 0 1.0E5
 RZFX TCUM 0 0 1.0E5

ATTACHMENT 3. EXAMS OUTPUT FOR VINCLOZOLIN

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
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1948	2.913	1.160	0.245	0.086	0.057	0.017
1949	2.913	1.160	0.245	0.086	0.057	0.017
1950	2.913	1.160	0.245	0.086	0.057	0.017
1951	2.913	1.160	0.245	0.086	0.057	0.017
1952	2.913	1.160	0.245	0.086	0.057	0.017
1953	2.913	1.160	0.245	0.086	0.057	0.017
1954	2.913	1.160	0.245	0.086	0.057	0.017
1955	2.913	1.160	0.245	0.086	0.057	0.017

1956	2.913	1.160	0.245	0.086	0.057	0.017
1957	2.913	1.160	0.245	0.086	0.057	0.017
1958	2.913	1.160	0.245	0.086	0.057	0.017
1959	2.913	1.160	0.245	0.086	0.057	0.017
1960	2.913	1.160	0.245	0.086	0.057	0.017
1961	2.913	1.160	0.245	0.086	0.057	0.017
1962	2.913	1.160	0.245	0.086	0.057	0.017
1963	2.913	1.160	0.245	0.086	0.057	0.017
1964	2.913	1.160	0.245	0.086	0.057	0.017
1965	2.913	1.160	0.245	0.086	0.057	0.017
1966	2.913	1.160	0.245	0.086	0.057	0.017
1967	2.913	1.160	0.245	0.086	0.057	0.017
1968	2.913	1.160	0.245	0.086	0.057	0.017
1969	2.913	1.160	0.245	0.086	0.057	0.017
1970	2.913	1.160	0.245	0.086	0.057	0.017
1971	2.913	1.160	0.245	0.086	0.057	0.017
1972	2.913	1.160	0.245	0.086	0.057	0.017
1973	2.913	1.160	0.245	0.086	0.057	0.017
1974	2.913	1.160	0.245	0.086	0.057	0.017
1975	2.913	1.160	0.245	0.086	0.057	0.017
1976	2.913	1.160	0.245	0.086	0.057	0.017
1977	2.913	1.160	0.245	0.086	0.057	0.017
1978	2.913	1.160	0.245	0.086	0.057	0.017
1979	2.913	1.160	0.245	0.086	0.057	0.017
1980	2.913	1.160	0.245	0.086	0.057	0.017
1981	2.913	1.160	0.245	0.086	0.057	0.017
1982	2.913	1.160	0.245	0.086	0.057	0.017
1983	2.913	1.160	0.245	0.086	0.057	0.017

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
-----	-----	-----	-----	-----	-----	-----
0.027	2.913	1.160	0.245	0.086	0.057	0.017
0.054	2.913	1.160	0.245	0.086	0.057	0.017
0.081	2.913	1.160	0.245	0.086	0.057	0.017
0.108	2.913	1.160	0.245	0.086	0.057	0.017
0.135	2.913	1.160	0.245	0.086	0.057	0.017
0.162	2.913	1.160	0.245	0.086	0.057	0.017
0.189	2.913	1.160	0.245	0.086	0.057	0.017
0.216	2.913	1.160	0.245	0.086	0.057	0.017
0.243	2.913	1.160	0.245	0.086	0.057	0.017
0.270	2.913	1.160	0.245	0.086	0.057	0.017
0.297	2.913	1.160	0.245	0.086	0.057	0.017
0.324	2.913	1.160	0.245	0.086	0.057	0.017
0.351	2.913	1.160	0.245	0.086	0.057	0.017
0.378	2.913	1.160	0.245	0.086	0.057	0.017
0.405	2.913	1.160	0.245	0.086	0.057	0.017
0.432	2.913	1.160	0.245	0.086	0.057	0.017
0.459	2.913	1.160	0.245	0.086	0.057	0.017
0.486	2.913	1.160	0.245	0.086	0.057	0.017
0.514	2.913	1.160	0.245	0.086	0.057	0.017
0.541	2.913	1.160	0.245	0.086	0.057	0.017
0.568	2.913	1.160	0.245	0.086	0.057	0.017
0.595	2.913	1.160	0.245	0.086	0.057	0.017
0.622	2.913	1.160	0.245	0.086	0.057	0.017

0.649	2.913	1.160	0.245	0.086	0.057	0.017
0.676	2.913	1.160	0.245	0.086	0.057	0.017
0.703	2.913	1.160	0.245	0.086	0.057	0.017
0.730	2.913	1.160	0.245	0.086	0.057	0.017
0.757	2.913	1.160	0.245	0.086	0.057	0.017
0.784	2.913	1.160	0.245	0.086	0.057	0.017
0.811	2.913	1.160	0.245	0.086	0.057	0.017
0.838	2.913	1.160	0.245	0.086	0.057	0.017
0.865	2.913	1.160	0.245	0.086	0.057	0.017
0.892	2.913	1.160	0.245	0.086	0.057	0.017
0.919	2.913	1.160	0.245	0.086	0.057	0.017
0.946	2.913	1.160	0.245	0.086	0.057	0.017
0.973	2.913	1.160	0.245	0.086	0.057	0.017
1/10	2.913	1.160	0.245	0.086	0.057	0.017

MEAN OF ANNUAL VALUES = 0.017
 STANDARD DEVIATION OF ANNUAL VALUES = 0.000
 UPPER 90% CONFIDENCE LIMIT ON MEAN = 0.017

ATTACHMENT 4. DCA PRZM INPUT FILE

```
*** PRZM3.12 Input Data File converted from PRZM2.3 ***
*** NDCAN.INP 1/6/00 ***
*** Assume continuous CANOLA, planted on predominant soil in county with ***
*** largest canola acreage in usa; Soil = hamerly loam; ***
*** Manning's N value for small grainS, moderate stand, across slope 6% ***
dca
Hamerly loam; MLRA 55a, Cavalier County, North Dakota
  0.760  0.500      0  12.00      1      1
    4
  0.28   0.35     1.00   172.8    5.40      3    3.00   600.0
    1
    1   0.10    22.00   80.00      3   91   86   89    0.00   100.0
    1     3
0101 1505 0109
0.38 0.10 0.07
.023 .023 .023
  36
150548 150848 250848      1
150549 150849 250849      1
150550 150850 250850      1
150551 150851 250851      1
150552 150852 250852      1
150553 150853 250853      1
150554 150854 250854      1
150555 150855 250855      1
150556 150856 250856      1
150557 150857 250857      1
150558 150858 250858      1
150559 150859 250859      1
150560 150860 250860      1
```

150561	150861	250861		1
150562	150862	250862		1
150563	150863	250863		1
150564	150864	250864		1
150565	150865	250865		1
150566	150866	250866		1
150567	150867	250867		1
150568	150868	250868		1
150569	150869	250869		1
150570	150870	250870		1
150571	150871	250871		1
150572	150872	250872		1
150573	150873	250873		1
150574	150874	250874		1
150575	150875	250875		1
150576	150876	250876		1
150577	150877	250877		1
150578	150878	250878		1
150579	150879	250879		1
150580	150880	250880		1
150581	150881	250881		1
150582	150882	250882		1
150583	150883	250883		1

Application Schedule:

36	1	0	0
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dca

140648	0	2	0.00	0.29	0.95	0.16
140649	0	2	0.00	0.29	0.95	0.16
140650	0	2	0.00	0.29	0.95	0.16
140651	0	2	0.00	0.29	0.95	0.16
140652	0	2	0.00	0.29	0.95	0.16
140653	0	2	0.00	0.29	0.95	0.16
140654	0	2	0.00	0.29	0.95	0.16
140655	0	2	0.00	0.29	0.95	0.16
140656	0	2	0.00	0.29	0.95	0.16
140657	0	2	0.00	0.29	0.95	0.16
140658	0	2	0.00	0.29	0.95	0.16
140659	0	2	0.00	0.29	0.95	0.16
140660	0	2	0.00	0.29	0.95	0.16
140661	0	2	0.00	0.29	0.95	0.16
140662	0	2	0.00	0.29	0.95	0.16
140663	0	2	0.00	0.29	0.95	0.16
140664	0	2	0.00	0.29	0.95	0.16
140665	0	2	0.00	0.29	0.95	0.16
140666	0	2	0.00	0.29	0.95	0.16
140667	0	2	0.00	0.29	0.95	0.16
140668	0	2	0.00	0.29	0.95	0.16
140669	0	2	0.00	0.29	0.95	0.16
140670	0	2	0.00	0.29	0.95	0.16
140671	0	2	0.00	0.29	0.95	0.16
140672	0	2	0.00	0.29	0.95	0.16
140673	0	2	0.00	0.29	0.95	0.16
140674	0	2	0.00	0.29	0.95	0.16
140675	0	2	0.00	0.29	0.95	0.16
140676	0	2	0.00	0.29	0.95	0.16
140677	0	2	0.00	0.29	0.95	0.16

140678 0 2 0.00 0.29 0.95 0.16
 140679 0 2 0.00 0.29 0.95 0.16
 140680 0 2 0.00 0.29 0.95 0.16
 140681 0 2 0.00 0.29 0.95 0.16
 140682 0 2 0.00 0.29 0.95 0.16
 140683 0 2 0.00 0.29 0.95 0.16
 0.0 1 0.0
 0.0 0.0 0.5
 Hamerly loam; Hydrologic Group C;
 100.00 0 0 1 0 0 0 0 0
 0.00 0.00 0.00
 4 309
 3
 1 15.00 1.400 0.224 0.000 0.000
 0.000 0.000 0.000
 0.10 0.224 0.108 2.320 0.00
 2 80.00 1.500 0.224 0.000 0.000
 0.000 0.000 0.000
 2.00 0.224 0.108 0.174 0.00
 3 5.00 1.500 0.228 0.000 0.000
 0.000 0.000 0.000
 5.00 0.228 0.110 0.116 0.00
 0
 10 YEAR 10 YEAR 10 YEAR 10 1
 1
 1 -----
 7 YEAR
 PRCP TCUM 0 0
 RUNF TCUM 0 0
 INFL TCUM 1 1
 ESLS TCUM 0 0 1.0E3
 RFLX TCUM 0 0 1.0E5
 EFLX TCUM 0 0 1.0E5
 RZFX TCUM 0 0 1.0E5

ATTACHMENT 5. EXAMS OUTPUT FOR DCA

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
1948	1.759	1.698	1.517	1.145	0.900	0.265
1949	1.746	1.653	1.341	1.200	1.032	0.308
1950	1.698	1.607	1.354	0.907	0.692	0.201
1951	1.701	1.610	1.305	0.957	0.766	0.234
1952	2.822	2.712	2.199	1.585	1.239	0.363
1953	8.630	8.169	6.748	4.371	3.322	0.913
1954	2.684	2.542	2.075	1.585	1.266	0.390
1955	2.120	2.007	1.654	1.285	0.999	0.309
1956	1.709	1.618	1.334	1.006	0.792	0.243
1957	1.786	1.691	1.475	0.990	0.753	0.220
1958	1.699	1.608	1.311	0.930	0.715	0.202
1959	1.879	1.779	1.562	1.131	0.869	0.258

1960	2.438	2.334	1.909	1.307	1.035	0.309
1961	1.801	1.732	1.476	1.139	0.882	0.262
1962	1.703	1.612	1.362	0.952	0.729	0.213
1963	2.613	2.496	2.177	1.623	1.274	0.370
1964	2.427	2.297	1.933	1.390	1.070	0.312
1965	1.709	1.618	1.297	0.952	0.826	0.256
1966	2.414	2.285	2.062	1.571	1.263	0.378
1967	1.702	1.611	1.291	0.833	0.631	0.214
1968	3.009	2.848	2.452	1.719	1.407	0.424
1969	2.400	2.273	1.888	1.546	1.298	0.393
1970	6.141	5.845	4.692	3.067	2.341	0.674
1971	2.125	2.060	1.712	1.157	0.895	0.312
1972	1.709	1.618	1.341	0.873	0.680	0.219
1973	1.703	1.613	1.296	0.844	0.702	0.253
1974	1.701	1.611	1.291	0.840	0.722	0.222
1975	1.833	1.735	1.414	0.997	0.810	0.282
1976	1.963	1.858	1.622	1.084	0.824	0.258
1977	1.701	1.610	1.322	0.871	0.673	0.247
1978	1.699	1.608	1.295	0.882	0.684	0.221
1979	1.701	1.611	1.290	0.920	0.720	0.210
1980	1.736	1.644	1.378	1.219	1.016	0.305
1981	1.698	1.608	1.288	1.166	0.972	0.298
1982	1.699	1.608	1.288	0.853	0.649	0.199
1983	3.141	2.973	2.487	1.741	1.346	0.399

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
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0.027	8.630	8.169	6.748	4.371	3.322	0.913
0.054	6.141	5.845	4.692	3.067	2.341	0.674
0.081	3.141	2.973	2.487	1.741	1.407	0.424
0.108	3.009	2.848	2.452	1.719	1.346	0.399
0.135	2.822	2.712	2.199	1.623	1.298	0.393
0.162	2.684	2.542	2.177	1.585	1.274	0.390
0.189	2.613	2.496	2.075	1.585	1.266	0.378
0.216	2.438	2.334	2.062	1.571	1.263	0.370
0.243	2.427	2.297	1.933	1.546	1.239	0.363
0.270	2.414	2.285	1.909	1.390	1.070	0.312
0.297	2.400	2.273	1.888	1.307	1.035	0.312
0.324	2.125	2.060	1.712	1.285	1.032	0.309
0.351	2.120	2.007	1.654	1.219	1.016	0.309
0.378	1.963	1.858	1.622	1.200	0.999	0.308
0.405	1.879	1.779	1.562	1.166	0.972	0.305
0.432	1.833	1.735	1.517	1.157	0.900	0.298
0.459	1.801	1.732	1.476	1.145	0.895	0.282
0.486	1.786	1.698	1.475	1.139	0.882	0.265
0.514	1.759	1.691	1.414	1.131	0.869	0.262
0.541	1.746	1.653	1.378	1.084	0.826	0.258
0.568	1.736	1.644	1.362	1.006	0.824	0.258
0.595	1.709	1.618	1.354	0.997	0.810	0.256
0.622	1.709	1.618	1.341	0.990	0.792	0.253
0.649	1.709	1.618	1.341	0.957	0.766	0.247
0.676	1.703	1.613	1.334	0.952	0.753	0.243
0.703	1.703	1.612	1.322	0.952	0.729	0.234
0.730	1.702	1.611	1.311	0.930	0.722	0.222
0.757	1.701	1.611	1.305	0.920	0.720	0.221

0.784	1.701	1.611	1.297	0.907	0.715	0.220
0.811	1.701	1.610	1.296	0.882	0.702	0.219
0.838	1.701	1.610	1.295	0.873	0.692	0.214
0.865	1.699	1.608	1.291	0.871	0.684	0.213
0.892	1.699	1.608	1.291	0.853	0.680	0.210
0.919	1.699	1.608	1.290	0.844	0.673	0.202
0.946	1.698	1.608	1.288	0.840	0.649	0.201
0.973	1.698	1.607	1.288	0.833	0.631	0.199
1/10	3.049	2.885	2.463	1.726	1.364	0.406

MEAN OF ANNUAL VALUES = 0.309

STANDARD DEVIATION OF ANNUAL VALUES = 0.138

UPPER 90% CONFIDENCE LIMIT ON MEAN = 0.343

ATTACHMENT 6. GENEEC OUTPUT FILE

RATE (#/AC) ONE(MULT)	APPLICATIONS NO.-INTERVAL	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCORP DEPTH(IN)
1.330(3.360)	3 14	535.0	2.6	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
53.00	0	12.00*	27.60- 3386.52	.00	11.96

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
64.83	58.70	35.83	17.51

* Hydrolysis of vinclozolin is extremely sensitive to pH. Half lives are 42 days, 1.3 days, 0.03 days for pH of 5, 7, and 9, respectively (MRID 41471006). However, the rate of actual DCA formation was considerably slower. For example, half lives of vinclozolin plus metabolite B were 90 days and 20 days at pH 5 and 7, respectively. Due to the short duration of these hydrolysis experiments (2 hours), the reliability of these half lives is low. Therefore a reasonably conservative half life of 12 days was used here (60 percent of the value of the pH 7 vinclozolin plus metabolite B value). Note that for the case of DCA production (as opposed to vinclozolin degradation), shorter vinclozolin half lives give more conservative estimates of DCA.